

APPENDIX A

AIR RIGHTS FEASIBILITY SUMMARY OF TECHNICAL FINDINGS January 28, 2011

This summary provides a brief update on the study related to the technical feasibility of air rights in the Dulles Corridor and to evaluate the level of investment required (if any) concurrent with the Phase 2 rail construction in order to not preclude future air rights development. This study was authorized by the Airports Authority for Dulles Rail Consultants to prepare the technical analysis and resulted in a final report delivered in November 2010. The following outlines the basis for the evaluation and summary findings:

Basis of Design Concepts and Technical Evaluation

- The Reston Parkway Station was selected as the prototype Phase 2 station location selected for the air rights evaluation based on its proximity to Reston Town Center and other commercial development and interest expressed by the Reston community and Fairfax County in this location.
- Three initial locations for the air rights deck location (see **Figure 1**) were developed including:
 - Air Rights Deck Directly Over the Reston Parkway Station
 - Air Rights Deck Straddling Reston Parkway
 - Air Rights Deck West of the Reston Parkway Station
- The DRC team utilized the prior work developed by Davis Carter Scott (DCS) and structural engineer Fernandez Associates Structural Engineers (FASE) which had designed a structural framing system that would permit construction of an air rights deck while maintaining Metrorail and vehicular operations on the DTR/DIAAH below.
- The underlying premise of the framing concept is the installation of a continuous reinforced concrete footing/foundation system supported by a series of auger-driven piles following each side of the Metrorail right-of-way with a pier cap/barrier wall that serves as the guide for the travelling form system. This permanent foundation system and barrier wall (indicated as Stage 1 in **Figure 2**) would be installed as part of the Phase 2 project and would serve as the perimeter walls for the rail right-of-way. Stage 2 would be installed when the future air rights deck would be constructed, and Stage 3 when the future air rights development would be built. A similar foundation system would be installed at a future date below the Jersey barrier walls between the DIAAH and the DTR and along the outside property lines of the DTR.
- The framing system for construction of the air rights deck consists of a series of collapsible modular forms that would travel along the existing barrier wall system to be built as part of the initial Phase 2 construction along the site of the future air rights deck. The air rights deck would be built in 30-foot segments spanning between 50 and 60 feet depending on the location of the foundation system (see **Figure 3**).

- The **original study concept design** included **minimal span lengths** for the air rights deck framing system of **60 feet on 30 foot centers over the Metrorail right-of-way**. This concept required investment in the foundation system as part of the Phase 2 project that would not preclude future construction of air rights development, since there are insufficient clearances adjacent to the active railroad to construct a foundation system at a future date. Cross sections showing the original design concept are shown in **Figure 4**.
- The **alternative design concept** provides a **clear span over the Metrorail right-of-way** for an air rights deck framing system, **with 150 foot spans on 30 foot centers**. The alternative design reduces (or rather eliminates) the initial investment required as part of Phase 2 to not preclude future air rights development. The system of Jersey barriers being used to build Phase 1 of the Dulles Corridor Metrorail project along the DIAHH median would be used for this construction. Temporary shutdowns of the operating railroad would be necessary during off hours and selected weekends for placement of structural beams and building the initial parking deck slab. Once the initial deck is in place, construction can continue without any disruption to rail operations. A cross section showing the alternative design concept is shown in **Figure 5**, with a rendering of the alternate concept shown as **Figure 6**.

Summary of Findings

- Based on the analysis described above, it was determined that using a long span structural framing and foundation system would not require any additional investment in the Phase 2 Metrorail Project:
 - The cost premium associated with the alternate concept with the framing system featuring longer 150' spans and building the basic air rights deck at a future date over the operating railroad is **approximately 30 percent greater** than the original concept featuring 60' spans and building the initial substructure concurrent with Phase 2.
 - Building the 60' span framing and foundation system as part of Phase 2 would still result in having to shut down rail operations intermittently after hours and on weekends to build the balance of the air rights at a future date.
 - Building the 150' span over Metrorail at a future date would also result in having to shut down rail operations intermittently after hours and on weekends to build the air rights deck.
 - For either span concept, lane closures would still be required for construction of the balance of the foundation systems between the DIAHH/DTR and the outside lanes and shoulder of the DTR

Figure 1: Air Rights Deck Location Options at Reston Parkway Station

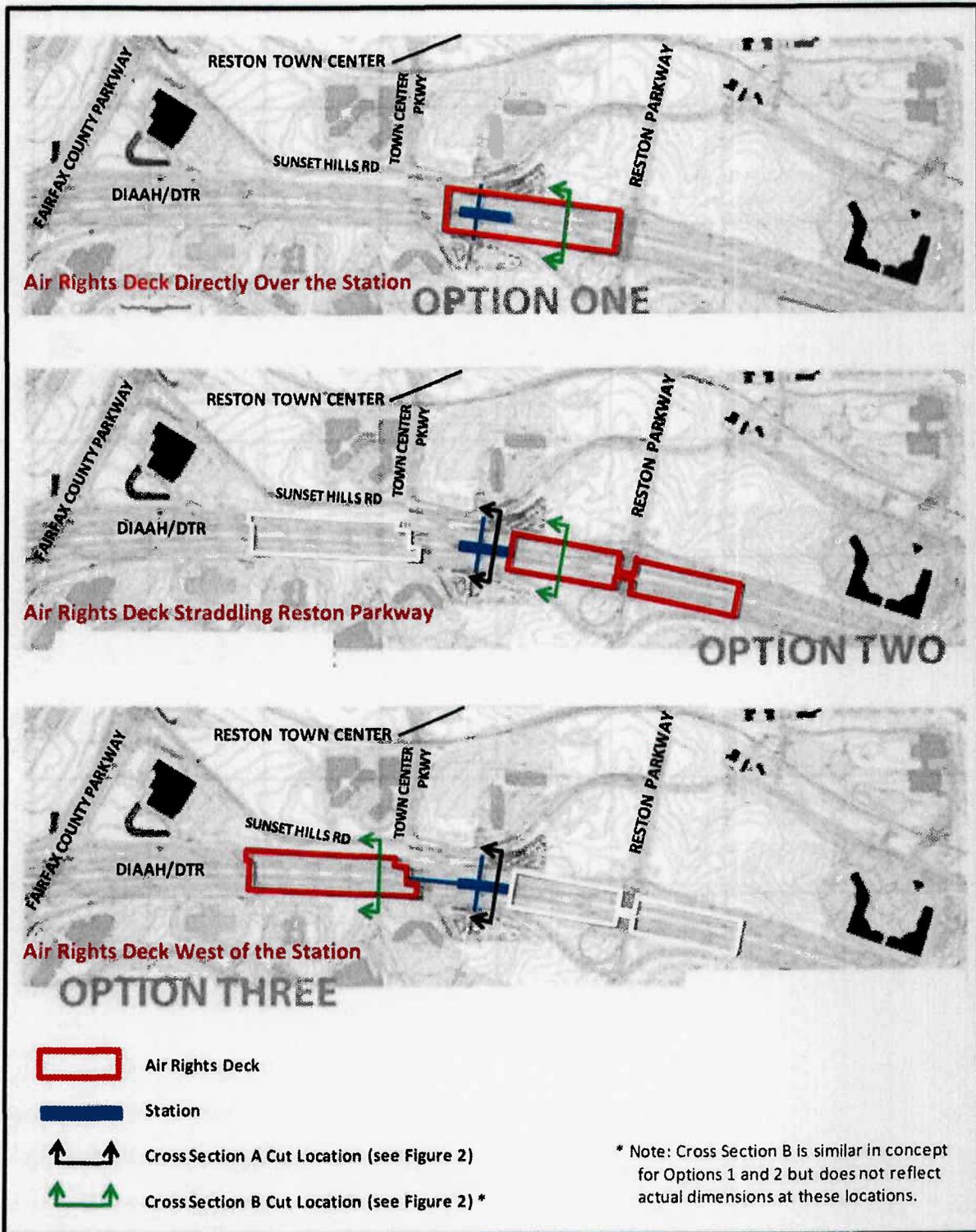


Figure 2: Typical Foundation and Column/Bent Frame Design Concept

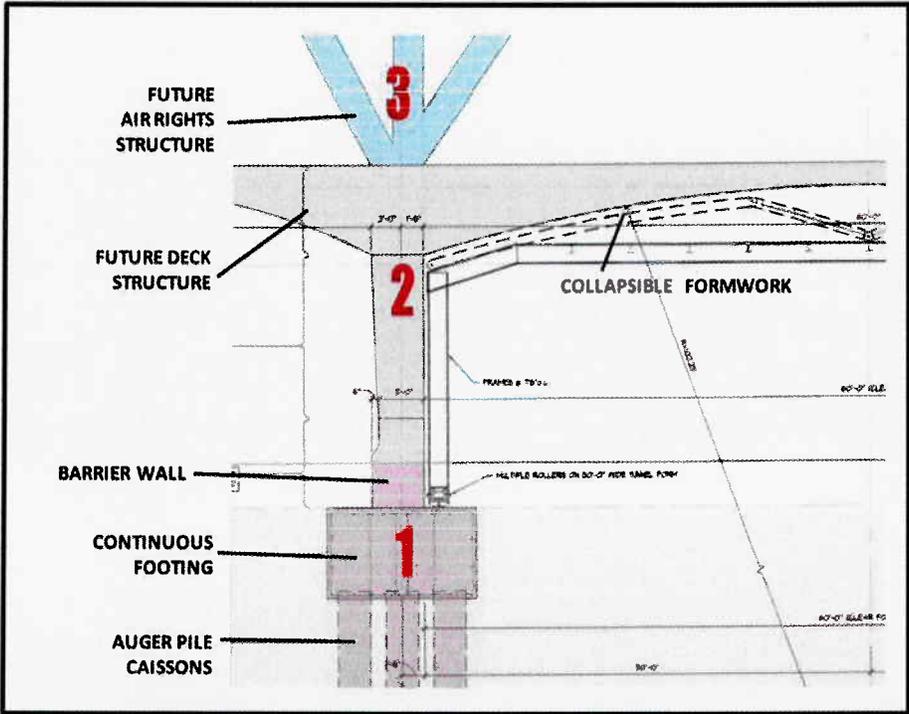


Figure 3: Foundation System Elements

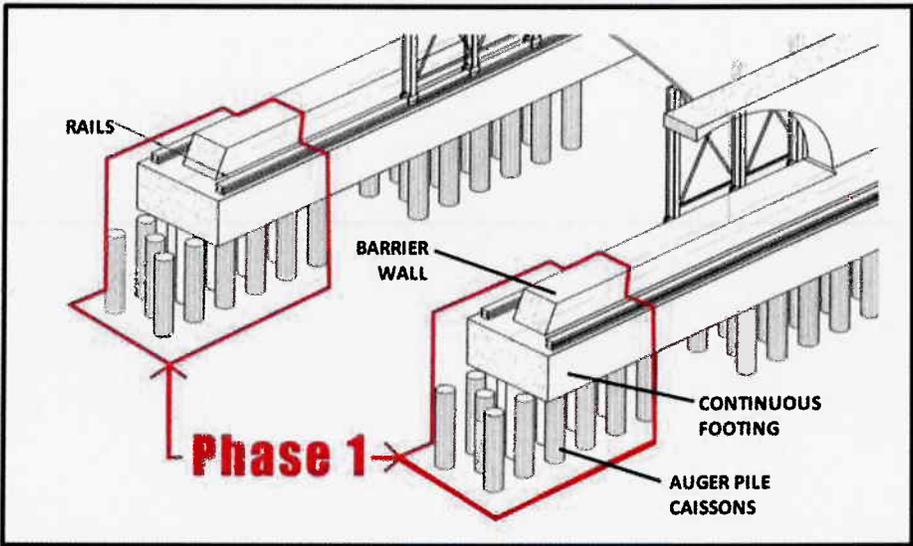
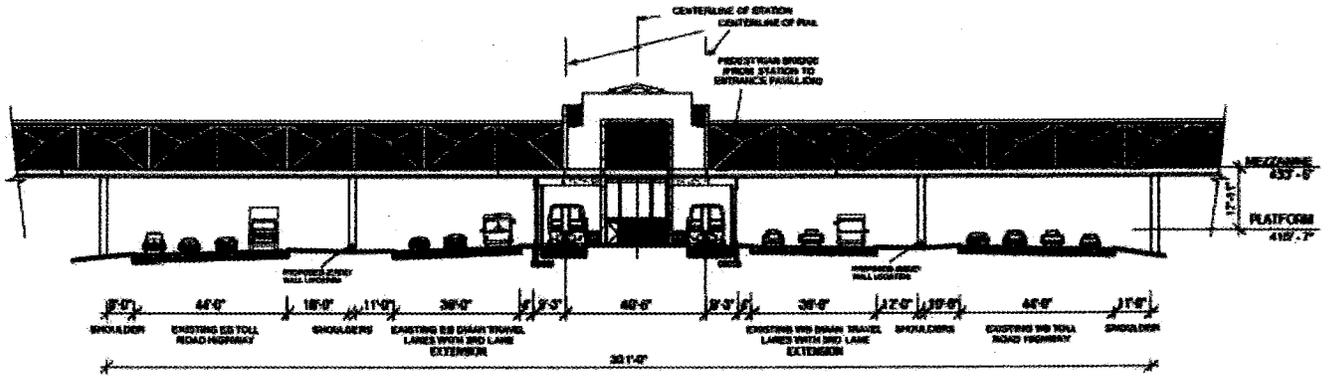
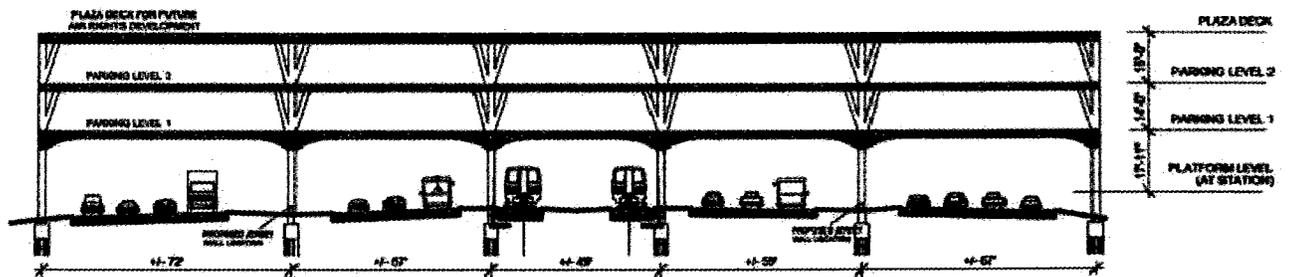


Figure 4: Original Design Concept with 60' Spans



CROSS SECTION: FUTURE EXISTING CONDITION WITH 3RD LANE BUILT



CROSS SECTION: AIR RIGHTS DEVELOPMENT

Figure 5: Alternate Design Concept w/ 150' Spans over Metrorail

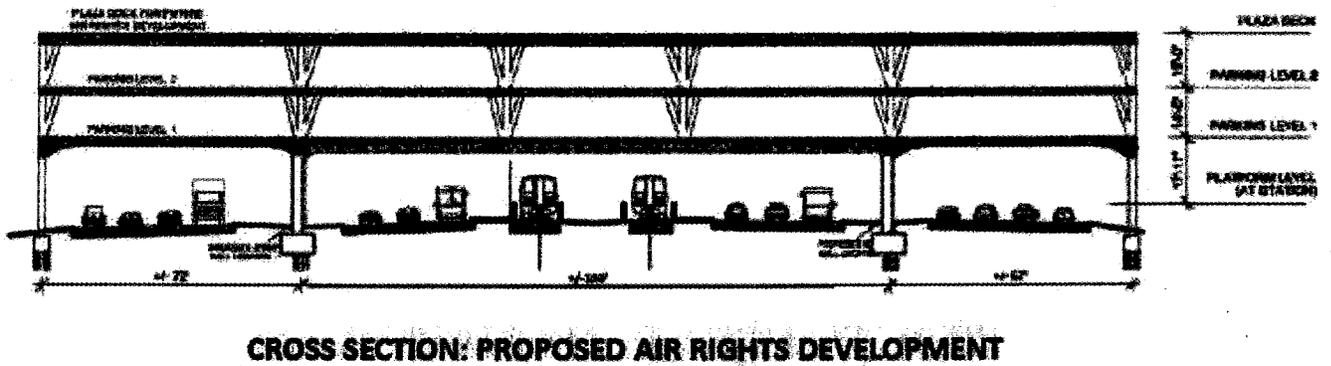
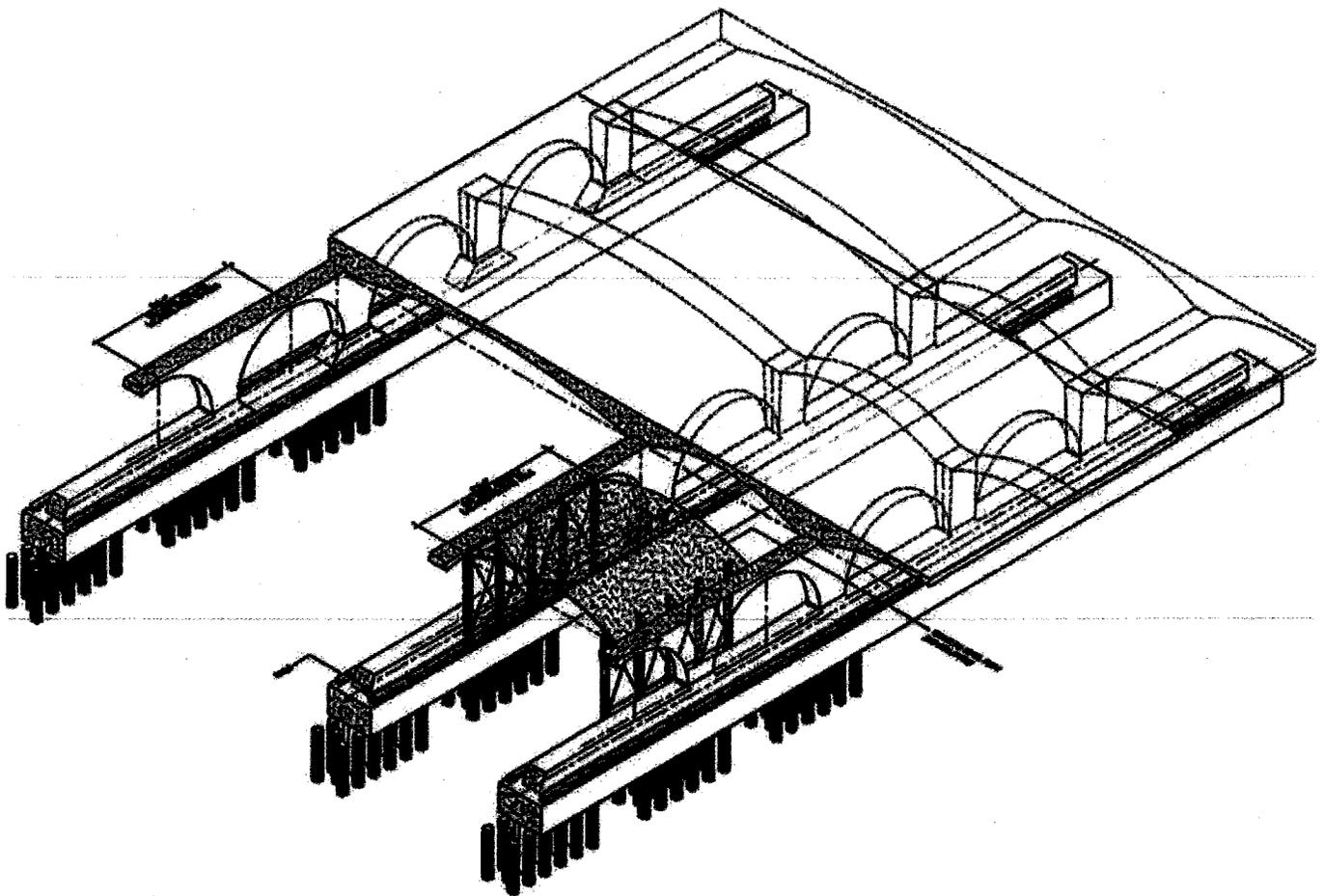


Figure 6: Rendering of Alternate Design Concept w/ 150' Spans over Metrorail





Phase 2 Metrorail Workshop:
Reston Air Rights Infrastructure
Business Case Review Summary

for:

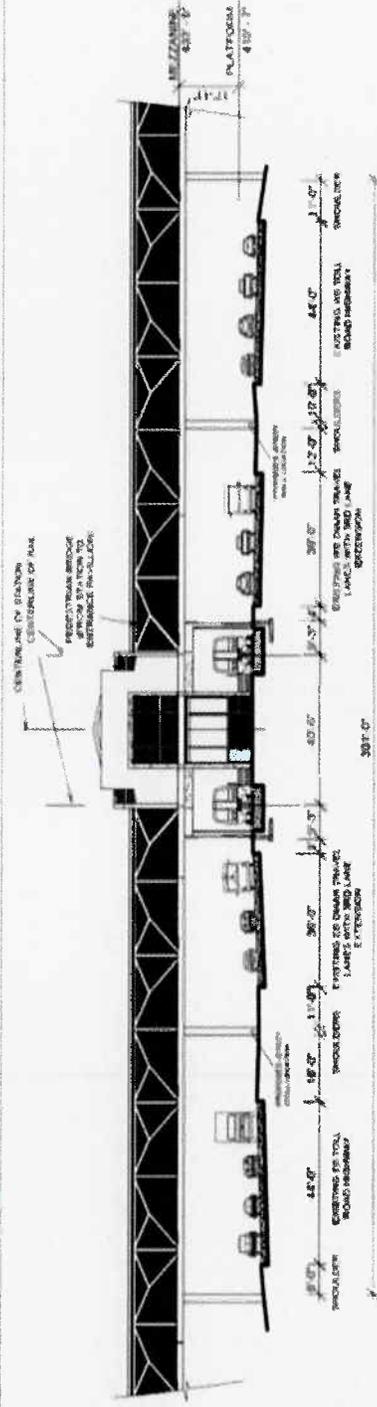
Dulles Corridor Committee

February 15, 2011

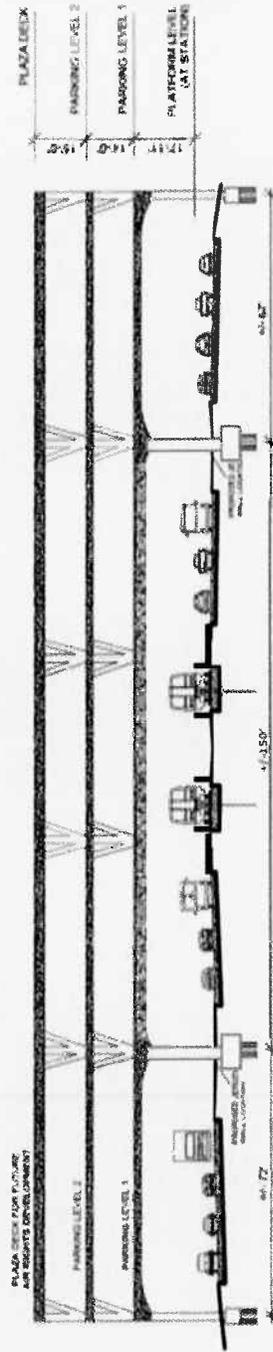


METROPOLITAN WASHINGTON AIRPORTS AUTHORITY

Air Rights Deck Framing Systems 60 Foot and 150 Foot Spans



CROSS SECTION: FUTURE EXISTING CONDITION WITH 3RD LANE BUILT

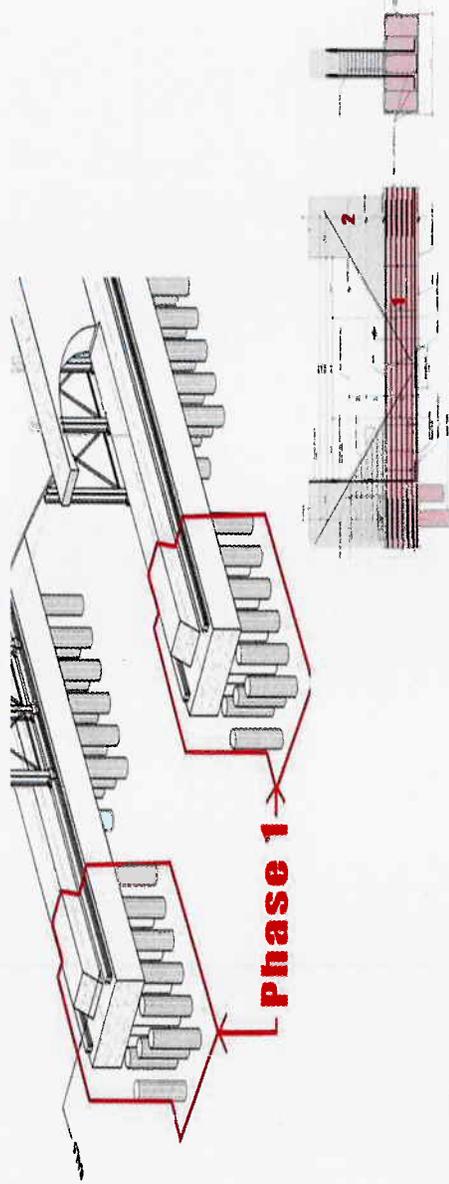


CROSS SECTION: AIR RIGHTS DEVELOPMENT



METROPOLITAN WASHINGTON AIRPORTS AUTHORITY

Air Rights Deck Framing System Typical Foundation System





Air Rights Business Case Review: Key “Base Case” Assumptions

- Phase 2 investment in foundations is \$34 million
- Total development cost is \$1.5 billion
- Approximately 4 million s.f. of commercial and residential space is realized (2.2 million commercial, 1.8 million residential)
- Foundation construction from 2014 to 2015; actual air rights platform and building construction from 2016 to 2028
- Full market absorption by 2028
- Interest rate 7 percent; inflation rate 3 percent, cap rate 8 percent



Air Rights Business Case Review: “Base Case” Financial Results

- Internal Rate of Return (IRR) after financing is 14.4 percent, which would be marginal to most developers for this type project
- Internal Rate of Return (IRR) after financing of 20 percent would be considered favorable by developers for this project given risks and sensitivity



Business Case Review: Internal Rate of Return: Sensitivity

IRR after financing:

annual inflation	0%	1%	2%	3%	4%
	8.2%	10.4%	12.5%	14.4%	16.3%
interest rate	5.0%	6.0%	7.0%	8.0%	9.0%
	17.1%	15.8%	14.4%	13.1%	11.7%
residual value cap rate	7.0%	8.0%	9.0%	10.0%	11.0%
	15.8%	14.4%	13.1%	12.0%	10.9%
cost under/overrun	-2.5%	-1.0%	0.0%	5.0%	7.0%
	20.8%	16.0%	14.4%	10.3%	9.3%
density/FAR	3.8	4.5	5.1	5.8	6.9
	12.8%	13.3%	13.7%	14.0%	14.4%
Absorption	2018-28	2023-33	2028-38		
IRR	14.4%	12.5%	10.9%		

Base Case



Air Rights Business Case Review: Assumption Variables – Risk Factors

Absorption rate for the Reston Station area*

Existing non-residential	14.4 million s.f.
Existing and approved zoning	18.9 million s.f.
Existing and current planned	22.4 million s.f.
GMU 2030 demand	18.8 million s.f.
GMU 2040 demand	21.4 million s.f.
-- (existing and planned space is absorbed) --	
GMU 2050 demand	24.7 million s.f.

* Fairfax County Department of Planning and Zoning and George Mason University Center for Regional Analysis



Air Rights Business Case Review: Recommendations

- **Plan for long-span approach and avoid immediate, major investments**
- **Do not make a Phase 2 capital investment in air rights foundations for short-span approach**